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EXAMINER	
MICHALSKI, JUSTIN I	
ART UNIT	PAPER NUMBER
2644	

DATE MAILED: 01/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/727,903	COATS, ELON RAY	
	Examiner	Art Unit	
	Justin Michalski	2644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 May 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-45,66-100 and 121-124* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,6-9,28,29,38-45,66-70,84-86,95-100 and 121-124* is/are rejected.

7)☐ Claim(s) *5,10-27,30-37,71-83 and 87-94* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *5/16/05, 9/9/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 27 May 2005 have been fully considered but they are not persuasive.

Applicant argues regarding claims 1-37,66-94,121,123, on page 4-6, that Blackmer does not disclose a wave-shaping circuit operable to receive a square wave signal and to produce an intermediate signal containing sinusoidal signal components based on the square wave signal. This is not persuasive as Blackmer clearly discloses in Fig. 6 a square wave (6F) and a product of a gain circuit (400) which produces a sinusoidal signal (6G) from a square wave (Col. 15, lines 20-40).

Applicant argues regarding claims 38-45, 95-100, 122, and 124, on page 6 and 7, that Blackmer does not disclose a summation circuit to sum a sub-harmonic signal and an intermediate signal. This is not persuasive as Blackmer clearly disclose in Fig. 2 a summation circuit (summing resistors 16) operable to sum the sub-harmonic signal (output of 14B) and the third intermediate signal (output of 14A) to produce at least a portion of an output signal.

Applicant's arguments, see page 2-4, filed 27 May 2005, with respect to double patenting of claims 38-45 and 95-100 have been fully considered and are persuasive. The double patenting rejection of claims 38-45 and 95-100 has been withdrawn.

2. Art rejections stand as previously presented.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-3, 6-9, 28, 29, 38-40, 42-45, 66-70, 84-86, 95-100, 121-124 are rejected under 35 U.S.C. 102(b) as being anticipated by Blackmer (US Patent 4,182,930).

Regarding Claims 1 and 66, Blackmer discloses a method and sub-harmonic generator, comprising: an input filter operable to receive an input signal containing frequencies from among a first range and to produce a first intermediate signal containing frequencies from among a second range (Filter 38); a signal divider circuit operable to receive the first intermediate signal and to produce a square wave signal containing square wave signal components at fundamental frequencies from among a third range (Fig. 6F), the third range of frequencies being about one octave below the second range of frequencies (Col. 2, lines 56-59); a wave-shaping circuit operable to receive the square wave signal and to produce a second intermediate signal containing sinusoidal signal components from among frequencies corresponding to the respective fundamental frequencies of the square wave signal components (Fig. 6G); an RMS detector (Detector 46, Col. 5, lines 9-13) operable to produce an RMS signal corresponding to an instantaneous amplitude of the first intermediate signal; and a voltage controlled amplifier (gain control 24) operable to amplify the second

intermediate signal by an amount proportional to the RMS signal to produce a sub-harmonic signal (output of 24).

Regarding Claims 2 and 84, Blackmer further discloses a summing circuit operable to receive a stereo signal including a left channel signal and a right channel signal, and to aggregate the left and right channel signals to produce the input signal (input nodes to filter 38).

Regarding Claim 3, Blackmer discloses the input filter is a band-pass filter (Col. 4, lines 12-17) i.e. rejects all signal energy above about 100Hz).

Regarding Claims 6 and 67, Blackmer further discloses the band-pass filter (12 and 38) is operable to pass frequencies in the second range, the second range being contained within the first range (Col. 4, lines 12-49).

Regarding Claims 7, 8, 68 and 69, Blackmer further discloses, the band-pass filter (12) includes a low corner frequency of about 40 Hz and a high corner frequency of about 1 10 Hz such that the second range is about 40-110 Hz and a low corner frequency of about 56 Hz and a high corner frequency of about 96 Hz such that the second range is about 56-96 Hz (Col. 4, lines 12-49).

Regarding Claims 9 and 70, Blackmer further discloses a zero crossing detector (182) operable to produce a zero crossing signal that transitions each time the first intermediate signal substantially matches a reference potential.

Regarding Claims 28 and 85, Blackmer further discloses at least one band-pass filter operable to receive the input signal and to produce a third intermediate signal containing frequencies from among a fourth range (12B), the fourth range of

frequencies including at least some frequencies above the third range of frequencies (12A, Col. 4, lines 18-49); an amplifier operable to increase an amplitude of the third intermediate signal to produce a fourth intermediate signal (24); a left channel summation circuit operable to sum the left channel signal and the fourth intermediate signal to produce at least a portion of a left channel output signal (20B); and a right channel summation circuit operable to sum the right channel signal and the fourth intermediate signal to produce at least a portion of a right channel output signal (20A).

Regarding Claims 29 and 86, Blackmer further discloses a stereo width expansion circuit operable to (i) cancel energy at at least some frequencies from among a fourth range of frequencies from the left channel signal (12B) to produce at least a portion of a left channel output signal (20B); and (ii) cancel energy at at least some frequencies from among a fifth range of frequencies from the right channel signal (12C) to produce at least a portion of a right channel output signal (20A).

Regarding Claims 38 and 95, Blackmer discloses a method and sub-harmonic generator (Fig. 2), comprising: a sub-harmonic signal circuit operable to (i) receive an input signal containing frequencies from among a first range (input to 38), (ii) filter the input signal to produce a first intermediate signal containing frequencies from among a second range (12A), and (iii) produce a sub-harmonic signal from the first intermediate signal containing frequencies from among a third range (14A), the third range of frequencies being about one octave below the second range of frequencies (Col. 2, lines 56-59); at least one band-pass filter operable to receive the input signal and to

produce a second intermediate signal containing frequencies from among a fourth range (12B), the fourth range of frequencies including at least some frequencies above the third range of frequencies (Col. 4, lines 18-49); an amplifier operable to increase an amplitude of the second intermediate signal to produce a third intermediate signal (Fig. 4, amp 220); and a summation circuit operable to sum the sub-harmonic signal and the third indeterminate signal to produce at least a portion of an output signal (input node to 42).

Regarding Claims 39, 96-97, Blackmer further discloses the at least one band-pass filter includes first, second and third band-pass filters (12A, 12B, and 12n) such that a sum of outputs of the first, second, and third band-pass filters exclude frequencies substantially outside the fourth range, the first band-pass filter having a center frequency within about 35 Hz to about 45 Hz, the second band-pass filter having a center frequency within about 55 Hz to about 65 Hz, and the third band-pass filter having a center frequency within about 95 Hz to about 105 Hz (Col. 4, lines 26-49).

Regarding Claim 40, Blackmer further discloses the first band-pass filter has a center frequency of about 40 Hz, the second band-pass filter has a center frequency of about 58 Hz, and the third band-pass filter has a center frequency of about 98 Hz (Col. 4, lines 26-49).

Regarding Claims 42 and 98, Blackmer further discloses a user adjustment control operable to vary the magnitude of the second intermediate signal (Fig. 2, variable resistor 52).

Regarding Claims 43 and 99, Blackmer further discloses a low pass filter (filter 42) operable to (i) receive the sub-harmonic signal; and (ii) attenuate frequencies substantially below the third range to produce a filtered sub-harmonic signal, the summation circuit being further operable to sum the filtered sub-harmonic signal and the third intermediate signal to produce at least a portion of the output signal (input node to filter 42).

Regarding Claims 44 and 100, Blackmer further discloses the sub-harmonic circuit is further operable to produce a low pass signal containing frequencies from among those below a first corner frequency (low pass filter 42), and the summation circuit being further operable to sum (i) the sub-harmonic signal; (ii) the third intermediate signal; and (iii) the low pass signal to produce at least a portion of the output signal (output of filter 42).

Regarding Claim 45, Blackmer further discloses a summing circuit operable to receive a stereo signal including a left channel signal and a right channel signal (input node to filter 38), and to aggregate the left and right channel signals to produce the input signal (input nodes to 38); a left channel summation circuit operable to sum the left channel signal and the third intermediate signal to produce at least a portion of a left channel output signal (adder 22B); and a right channel summation circuit operable to sum the right channel signal and the third intermediate signal to produce at least a portion of a right channel output signal (adder 22A).

Regarding Claims 121 and 123 Blackmer discloses a method and apparatus comprising: a signal divider circuit (34) operable to receive a signal containing

frequencies from among a first range and to produce a square wave signal (Fig. 6B) containing square wave signal components at fundamental frequencies from among a second range of frequencies about one octave below the first range of frequencies (Col. 2, lines 56-59); a wave-shaping circuit operable to receive the square wave signal and to produce an intermediate signal containing sinusoidal signal components based on the square wave signal (Fig. 6G); and a voltage controlled amplifier operable to amplify the intermediate signal by an amount proportional to an instantaneous amplitude of the signal to produce a sub-harmonic signal (24).

Regarding Claims 122 and 124 Blackmer discloses a method and apparatus comprising: a sub-harmonic generator, comprising: a sub-harmonic signal circuit (34) operable to produce a sub-harmonic signal from a first signal containing frequencies from among a first range of frequencies such that the sub-harmonic signal contains frequencies from among a second range of frequencies being about one octave below the first range of frequencies (Col. 2, lines 56-59); at least one band-pass filter operable to produce an intermediate signal containing frequencies from among a third range of frequencies including at least some frequencies above the second range of frequencies (filters 12); and a summation circuit operable to sum the sub-harmonic signal and the intermediate signal to produce at least a portion of an output signal (input node to 42).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Blackmer as applied to claim 3 above.

Blackmer discloses a band-pass filter but does not disclose it including bandpass filters having a low and high cutoff frequency. However, it is well known in the art that a band pass filter may be constructed using a low and high pass filter in series.

7. Claim 41 is rejected under 35 U.S.C. 103(a) as being unpatentable over Blackmer as applied to claim 40 above. Blackmer does not disclose a Q-factor of about 1.5 to 2, 1.75 to 2.25, and 1.75. to 2.25. Blackmer discloses a Q factor being adjustable by variable resistor 174 to adjust the Q of filter 12 (Col. 6, line 67 through Col. 7, line 2). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made adjust the value of Q within a certain range.

Allowable Subject Matter

8. Claims 5, 10-27, 30-37, 71-83, and 87-94 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Justin Michalski whose telephone number is (571)272-7524. The examiner can normally be reached on M-F 7-3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin can be reached on (571)272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JIM

January 17, 2006

HUYEN LE
PRIMARY EXAMINER